

## GPS - ACOUSTIC GEODETIC MEASUREMENT SYSTEM

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Over the recent past, with NASA support, we have been developing a combined GPS and underwater acoustic system to relate points on the deep sea floor to terrestrial references with centimeter accuracy. The primary reference points are long lived precision acoustic transponders on the sea floor. These are then interrogated from an acoustic transducer mounted in a float at the sea surface to determine its range from each transponder at a given instant. At the same time a set of three antennas mounted on the float are receiving GPS signals (recorded on the nearby tending ship) from which (operating in the differential mode) the precise location of the acoustic transducer can be determined. The end result is location of the transponders in global coordinates.

The first system of this type was installed and operated at a site on the Juan de Fuca Plate in June, 1991, as part of a long term Canadian/U. S. program to study convergence between the Juan de Fuca and North American Plates. Technical and operational aspects of the system, as well as results of analyses of data from the initial survey will be discussed.

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